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--8. A method for producing a desired protein or domain thereof, which comprises admixing:

(I) a first oligopeptide, said first oligopeptide comprising a fragment of said desired protein or domain thereof, and having a C-terminal thioester; and

(II) a second oligopeptide, said second oligopeptide comprising a fragment of said desired protein or domain thereof, and having an N-terminal amino acid residue having an unoxidized sulfhydryl side chain and a free amino group that is capable of forming a β -aminothioester linkage with said C-terminal thioester that rearranges to form an amide bond therein between; wherein said admixing is conducted under conditions sufficient to permit the formation of an amide bond between the C-terminus of said first oligopeptide fragment and the N-terminus of said second oligopeptide fragment.

9. The method of claim 8, wherein said N-terminal amino acid residue is a cysteine residue.

10. The method of claim 8, wherein said desired protein is a naturally isolatable protein.

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11. The method of claim 8, wherein said desired protein is a derivative of a naturally isolatable protein that contains one or more cysteine residues that are not found in said naturally isolatable protein.

12. The method of any of claims 10 or 11, wherein said protein is a mammalian protein.

13. The method of claim 12, wherein said mammalian protein is a human protein.

14. The method of claim 13, wherein said human protein is a cytokine.

15. The method of claim 8, wherein in said method said second oligopeptide has a C-terminal thioacid, and wherein said method additionally comprises the steps of:

(A) converting said thioacid to a thioester; and

(B) admixing said converted thioester with a third oligopeptide, said third oligopeptide comprising a fragment of said desired protein or domain thereof, and having an N-terminal amino acid residue having an unoxidized sulfhydryl side chain and a free amino group that is capable of forming a β -aminothioester linkage with said C-terminal thioester that rearranges to form an amide bond therein between, wherein said admixing is conducted under conditions sufficient to permit the formation of an amide bond between the C-terminus of said second oligopeptide fragment and the N-terminus of said third oligopeptide fragment.

16. The method of claim 15, wherein said N-terminal amino acid residue is a cysteine residue.

17. A synthetically produced protein of greater than about 35 amino acid residues, wherein all of the residues of said protein are linked to adjacent residues via an amide bond.

18. The synthetically produced protein of claim 17, wherein said protein has greater than about 70 amino acid residues.

19. The synthetically produced protein of claim 17, wherein said desired protein is a naturally isolatable protein.

20. The synthetically produced protein of claim 17, wherein said desired protein is a derivative of a naturally isolatable protein that contains one or more cysteine residues that are not found in said naturally isolatable protein.

21. The synthetically produced protein of any of claims 19 or 20, wherein said naturally isolatable protein is a mammalian protein.

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22. The method of claim 21, wherein said mammalian protein is a human protein.

23. The method of claim 22, wherein said human protein is a cytokine.

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24. A synthetically produced protein of greater than about 35 amino acid residues, wherein all of the residues of said protein are linked to adjacent residues via an amide bond, said protein being produced by the process of ligating together at least two oligopeptide fragments wherein:

(1) said first oligopeptide fragment has a C-terminal thioester; and

(2) said second oligopeptide fragment has an N-terminal amino acid residue having an unoxidized sulfhydryl side chain and a free amino group that is capable of forming a β -aminothioester linkage with said C-terminal thioester that rearranges to form an amide bond therein between; wherein said ligation results in the formation of an amide bond linking said first and second fragments.

25. The synthetically produced protein of claim 24, wherein said N-terminal amino acid residue is a cysteine residue.

26. The synthetically produced protein of claim 24, wherein said protein has greater than about 70 amino acid residues.

27. The synthetically produced protein of claim 24, wherein said desired protein is a naturally isolatable protein.

28. The synthetically produced protein of claim 24, wherein said desired protein is a derivative of a naturally isolatable protein that contains one or more cysteine residues that are not found in said naturally isolatable protein.

29. The synthetically produced protein of any of claims 27 or 28, wherein said naturally isolatable protein is a mammalian protein.